Space Weather Forecast

Issued on Friday, 16 December 2022 at 01:20 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Further Moderate flares likely from the Active sunspot in the southwest.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar Activity has been High with occasional moderate-class flares observed in the last 24 hours, mainly from the active sunspot in the southwest. This spot is magnetically very complex, and appears to be gradually developing and enlarging, and is the most significant on the visible disc There are six other sunspot regions on the visible disc. One is a moderately sized spot, with complex magnetic configuration, in the southeast quadrant. Most remaining regions on the disc are relatively small, weak and magnetically simple, showing little or no development.

No Earth-directed Coronal Mass Ejections where observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar wind speeds have been at slow ambient levels throughout. The total Interplanetary Magnetic Field was weak. The north-south component fluctuated, but was often weakly negative. Geomagnetic activity was Quiet (Kp 0-2).
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has persisted at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be Moderate, with further Moderate flares likely from the active sunspot in the southwest. There is a slight chance of rising to High with the potential for an isolated maximum Strong flare. New active regions are expected to rotate onto the visible disc over the next few days.

Solar Wind / Geomagnetic Activity: There are currently no Earth-directed CMEs. Although the missing CME from the 14th has a slight chance of giving a glancing interaction on day 4 (18th). Solar winds are expected to persist at Background speeds until at least day 3 (18th), when the arrival of fast winds from a coronal hole could occur. Although the strength and timing of any enhancement is low confidence. Mainly Quiet geomagnetic activity is expected, but with a chance of increasing to Unsettled to Active intervals, with a slight chance of Minor Storms from day 3 (18th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to persist at background, however this has a slight chance of rising in response to any notable flares that occur, perhaps exceeding the S1/Minor Storm level.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	40	40
Very Active	R3 to R5 X	No	15	15	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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